

Department of Commerce

Geological and Economic Survey

Mission

The Geological and Economic Survey's mission and broad charge is to carry out investigations of the geological formations and physical features of West Virginia (with particular emphasis on economic implications and geologic hazards) and to prepare special reports, analog and digital maps, and databases pertaining to the state's geology and natural resources in order to provide detailed geological information for the future growth of West Virginia, for sound decision-making, and for the economic and environmental benefit of the state and all of its citizens while incorporating the best technology available, including the geographic information system (GIS) and on-line services.

Operations

As West Virginia's principal agency concerned with applied geological science, the Geological and Economic Survey is responsible for the systematic study and evaluation of the geology of the state. Results of scientific investigations and resource development data are in the public domain through published reports and maps, computer media and database listings, files, records, and expert consultations.

Five functions characterize the agency's operations, programs, and projects: applied research, basic data collection and interpretation, public service, outreach, and GIS.

Management and Administration

- Provides management (planning, organization, motivation, communication, and control).
- Provides administrative support (accounting, budgeting, payroll, purchasing, publication, etc.).
- Formulates agency personnel and administrative policies.
- Maintains control of cash flows of the agency's General, Federal, and Special Revenue funds.
- Provides maintenance, security, and custodial support for all agency facilities and operations.

Applied Coal Resources Investigations

- Calculates remaining West Virginia coal resources available for extraction.
- Documents location of surface and underground mining activity.
- Collects, prepares, and analyzes coal bed samples.
- Maps economic coal beds of the state in GIS format.

Applied Oil and Gas Resources Investigations

- Conducts applied research related to efficient recovery of state oil and gas resources.
- Develops and maintains collection of basic oil and gas data in computerized and paper form.
- Maintains well-log core/sample libraries for public access.
- Examines and analyzes production and geologic characteristics of West Virginia oil fields.

General Geoscience

- Creates detailed geological maps for resource, environmental studies, and land use decisions.
- Develops new mathematical and statistical methods for analysis of geological data.
- Provides technological expertise on environmental geology issues relating to ground failure and slope stability (e.g., landslides, mine subsidence, and karst).

Geographic Information System

- Serves as fiscal agent in a collaborative effort and provides support for West Virginia state agencies (Geological Survey, Department of Revenue, WVU Department of Geology and Geography).
- Supports mission of GIS coordinator to develop state's GIS program (such as the West Virginia Statewide Addressing and Mapping Board).

Geological and Economic Survey

Information (Technology) Transfer

- Provides for dissemination of results of geoscience investigations.
- Provides information technology support for programs, including on-line services to the public.

Public Service

- Provides responses to requests from industry, government, and the public for earth science information, including Earth Science Information Center—a comprehensive repository of maps and aerial photography.
- Provide on-going training needed to develop a core of highly trained and motivated science educators.
- Promote agency's products/services to the public through outreach exhibits and presentations.



Expenditures

	TOTAL FTE POSITIONS 11/30/2005	ACTUALS FY 2005	BUDGETED FY 2006	REQUESTED FY 2007	GOVERNOR'S RECOMMENDATION
EXPENDITURE BY PROGRAM					
Applied Coal Resources Investigations	17.77	\$640,688	\$948,557	\$948,405	
Applied Oil & Gas Resources Investigations	6.98	262,559	511,317	516,232	
General Geoscience	1.99	233,907	200,298	200,020	
Geographic Information System (GIS)	14.27	1,448,057	2,088,875	1,552,028	
Information (Technology) Transfer	8.60	460,835	539,102	538,821	
Management & Administration	8.78	554,784	607,203	608,579	
Public Service	3.86	323,974	306,949	301,369	
Less: Reappropriated		(198,077)	(308,906)	0	
TOTAL BY PROGRAM	62.25	3,726,727	4,893,395	4,665,454	4,686,873
EXPENDITURE BY FUND					
General Fund					
FTE Positions		48.35	46.16	46.16	46.16
Total Personal Services		1,936,418	2,111,960	2,079,834	2,123,268
Employee Benefits		662,120	732,083	711,224	711,224
Other Expenses		779,953	997,166	712,289	687,289
Less: Reappropriated		(198,077)	(308,906)	0	0
Subtotal: General Fund		3,180,414	3,532,303	3,503,347	3,521,781
Federal Fund					
FTE Positions		3.07	3.07	3.07	3.07
Total Personal Services		89,403	91,261	89,581	91,261
Employee Benefits		14,210	31,470	27,193	31,470
Other Expenses		91,490	179,471	183,226	179,471
Subtotal: Federal Fund		195,103	302,202	300,000	302,202
Appropriated Special Fund					
FTE Positions		0.61	0.70	0.70	0.70
Total Personal Services		22,669	43,945	43,402	44,064
Employee Benefits		6,532	8,020	15,106	15,227
Other Expenses		31,986	164,425	157,099	157,099
Less: Reappropriated		0	0	0	0
Subtotal: Appropriated Special Fund		61,187	216,390	215,607	216,390
Nonappropriated Special Fund					
FTE Positions		9.56	12.32	9.82	9.82
Total Personal Services		112,918	440,245	368,070	368,070
Employee Benefits		41,757	142,987	120,129	120,129
Other Expenses		135,348	259,268	158,301	158,301
Subtotal: Nonappropriated Special Fund		290,023	842,500	646,500	646,500
TOTAL FTE POSITIONS BY FUND		61.59	62.25	59.75	59.75
TOTAL EXPENDITURES BY FUND		\$3,726,727	\$4,893,395	\$4,665,454	\$4,686,873

Programs

Management and Administration

Mission

To provide leadership and management (planning, organization, motivation, communication, control) and administrative support (accounting, budgeting, payroll, purchasing, administrative supervision, facilities maintenance) for all agency programs and personnel promoting equitable policies, goals, and objectives that lead the division in a direction that helps fulfill the visions and goals of the State and the Department of Commerce.

Goals/Objectives

- Identify and pursue through federal/contractual cooperative agreements and revenue-generating activities (publications sales, service requests).
- Eliminate all outstanding worksite safety/loss deficiencies.
- Present three in-house workshops or field trips per year to provide professional development for staff geologists.
- Comply with all state, federal, and contractual financial reporting requirements.
- Monitor and revise utilization and allocation of resources (human, funding, facilities, etc.) to ensure optimal cost-efficiency and cost-effectiveness.

Performance Measures

<u>Fiscal Year</u>	<u>Actual</u> <u>2003</u>	<u>Actual</u> <u>2004</u>	<u>Estimated</u> <u>2005</u>	<u>Actual</u> <u>2005</u>	<u>Estimated</u> <u>2006</u>	<u>Estimated</u> <u>2007</u>
Funding from alternate sources	\$568,848	\$498,933	N/A	\$711,016	\$750,000	\$800,000
Safety and loss prevention deficiencies outstanding	5	4	0	0	0	0

Applied Coal Resources Investigations

Mission

To conduct coal research projects that determine the quantity, quality, and location of West Virginia's coal resources and maintain coal occurrence, quality, and mined-area maps, reports, and data that can be utilized by the public, industrial, and government sectors for informed decision-making.

Goals/Objectives

- Expand the West Virginia coal stratigraphic database by adding a minimum of 1,000 new records each year (in cooperation with the National Coal Resources Data System, administered jointly by the U. S. Geological Survey and the State).
- Expand the West Virginia coal quality database (currently the largest of any state in the U.S.) by adding a minimum of 2,000 new records each year, making it possible to research specific coal quality applicable to current and emerging coal utilization technologies.
- Compile underground mined areas in GIS format within ten years.
- Conduct research to identify areas of the state most likely to have potential for coal bed methane production.

Performance Measures

<u>Fiscal Year</u>	<u>Actual</u> <u>2003</u>	<u>Actual</u> <u>2004</u>	<u>Estimated</u> <u>2005</u>	<u>Actual</u> <u>2005</u>	<u>Estimated</u> <u>2006</u>	<u>Estimated</u> <u>2007</u>
Records added to the coal stratigraphic database	1,690	4,970	3,000	1,990	1,000	1,000
Records added to the coal quality database	5,726	2,642	1,900	2,907	2,000	2,000

Applied Oil and Gas Resources Investigations

Mission

To conduct modern applied research projects at the statewide, regional, and local reservoir scales for West Virginia's conventional and unconventional oil and gas resources, providing basic information to the state's oil and gas industry, thus supporting the state's economic and employment opportunities.

Goals/Objectives

- Expand basic oil and gas database and complete digital conversion of the existing data logs by 2008.
- Expand West Virginia's representation in the U.S. Department of Energy's contractual oil and gas research efforts.
- Preserve and add to a well cuttings/core library facility, and plan for a new, more user-friendly storage facility by 2010.
- Sponsor workshops and seminars to share information about available technology to small independent oil and gas operators (in cooperation with the Petroleum Technology Transfer Council).
- Obtain additional external funding for detailed oil and gas reservoir studies.

Performance Measures

<u>Fiscal Year</u>	<u>Actual</u> <u>2003</u>	<u>Actual</u> <u>2004</u>	<u>Estimated</u> <u>2005</u>	<u>Actual</u> <u>2005</u>	<u>Estimated</u> <u>2006</u>	<u>Estimated</u> <u>2007</u>
New wells added to database	829	521	*0	*370	500	500
Existing data logs digitally available	10%	43%	50%	50%	75%	90%

* The number of wells added to the database was higher than estimated due to the filling of a vacant oil and gas geologist position in FY 2005.

General Geoscience

Mission

To provide research, information, service, and outreach capabilities including geologic and geographic maps, geologic hazards and environmental geology, geostatistical methods, digital cartography and remote sensing, and geodetic information to citizens, industries, schools, and government agencies to promote informed, intelligent, geology-related decision-making and problem solving.

Goals/Objectives

- Conduct detailed geological mapping, completing at least three 7.5 minute quadrangles each year.
- Develop a unified GIS model for geologic maps in North America (a cooperative effort with the American Association of State Geologists, U.S. Geological Survey, Geological Survey of Canada, Canadian Provincial Surveys, and the Geological Survey of Mexico)—the project is currently 50% complete.
- Conduct detailed geology investigations for planning, development, and mineral exploration/utilization.
- Respond to all requests for information in environmental geology and geologic hazards (e.g., landslides, mine subsidence, and karst).
- Complete the final version of the West Virginia State Hazard Mitigation Plan after FEMA completes the draft review. (The West Virginia Geological and Economic Survey is identified as the lead organization in hazard mapping.)
- Conduct advanced statistical methods for use by agencies in the evaluation of the state's natural resources, specifically fossil fuels.

Geological and Economic Survey Programs

- Develop digital cartographic products and remote sensing applications.
- Expand trace and major element geochemical database for rock units within the state by 50 samples per year.
- Release at least one Report of Investigation per year as a new Web page. (These reports are specific investigational studies resulting from the geological mapping of the state.

Performance Measures

- ✓ Submitted to FEMA in 2004 the draft of the West Virginia State Hazard Mitigation Plan.

<u>Fiscal Year</u>	<u>Actual 2003</u>	<u>Actual 2004</u>	<u>Estimated 2005</u>	<u>Actual 2005</u>	<u>Estimated 2006</u>	<u>Estimated 2007</u>
New geologic quadrangles completed	3	4	4	4	3	3
Samples added to geochemical database	61	59	50	28	50	50

Geographic Information System (GIS)

Mission

To develop (in partnership with state, federal, county, and local agencies and in cooperation with private industry) a comprehensive, standardized, public domain, digital cartographic database for West Virginia. This data is to be shared and used by government, general public, and business community to the economic and social benefit of West Virginia.

Goals/Objectives

- Provide administrative oversight and fiscal management of mineral lands mapping project (MLMP).
- Produce a minimum of 300 coal bed quad theme maps (GIS format database and maps characterizing the economic coal beds of the state) each year.
- Support the mission of GIS coordinator to develop, coordinate, and promote the GIS program.
- Support the mission of the West Virginia Tax Division in the digital conversion of surface tax parcel maps by FY 2011.
- Support the mission of the GIS Technical Center at WVU to develop and apply innovative and useful technical and educational capabilities for the state.
- By 2011, all of the 42 counties that contain property taxable coal should be using MLMP data in their reserve coal valuation model (RCVM).

Performance Measures

<u>Fiscal Year</u>	<u>Actual 2003</u>	<u>Actual 2004</u>	<u>Estimated 2005</u>	<u>Actual 2005</u>	<u>Estimated 2006</u>	<u>Estimated 2007</u>
Coal bed quad theme maps produced	119	123	200	1,386	300	300
Completion of parcel map digital conversions*	8%	15%	18%	29%	32%	34%
Counties using MLMP data in their RCVM	30%	40%	60%	46%	66%	70%

* Total number of estimated surface tax parcel maps is 900,000.

Information (Technology) Transfer

Mission

To provide and maintain programming and technical information support for agency staff and to facilitate the accumulation, documentation, and categorization of the results and interpretations.

Goals/Objectives

Applications designed for the public

- Design and implement by 2010 a graphical, mapping-based interface for the “pipeline” oil and gas well data application on the Web site.
- Upload scanned oil and gas well logs to the server every Friday.
- Update Web-based data:
 - * oil and gas well data—quarterly
 - * coal production data—annually
 - * interactive mapping—annually
- Implement the oil and gas production decline ratios and maps as a Web-based application.
- Update the oil and gas well database publication (*WVGES Oil and Gas Well Data for West Virginia*) on CD twice a year.

Agency databases

- Rewrite four priority validation programs for oil and gas well during FY 2006.
- Initiate a new federally-funded project: hire and train staff, purchase equipment, identify and prioritize scanning, and identify cores and thin-sections for digital imaging.
- Begin the digital conversion of selected maps to GIS format.

Agency computing and network infrastructure

- Redesign the agency’s firewall system in FY 2006 to permit public access to data while also providing better protection for agency data and resources.
- Design and implement an improved backup and recovery plan for agency servers, and implement an automated backup solution for the servers and specific PCs.
- Install and configure annual upgrades for database, GIS, and antivirus software.
- Replace five outdated/inadequate PCs in the agency every year.
- Replace older network switches in FY 2006 with a higher-capacity/faster 48-port switch to support resource-intensive network-based GIS applications.

Performance Measures

<u>Fiscal Year</u>	<u>Actual 2003</u>	<u>Actual 2004</u>	<u>Estimated 2005</u>	<u>Actual 2005</u>	<u>Estimated 2006</u>	<u>Estimated 2007</u>
Scanned well logs uploaded to the FTP server for public viewing and downloading	N/A	N/A	N/A	N/A	10,000	15,000
Files downloaded by the public from the agency Web site	26,098	51,748	N/A	72,212	80,000	90,000
PCs replaced	2	4	N/A	11	14	0

Public Service

Mission

To provide industry, government, and the general public with all aspects of West Virginia geoscience information, including mineral resource, cartographic, and general geology.

Goals/Objectives

- Respond to all requests for geological and mineral resource service, information, and sales requests from all sources through walk-in visits, telephone calls, letters, faxes, e-mail, etc.
- Conduct 12 earth science training workshops each year for K-12 teachers.
- Promote agency’s products/services to the public through at least four outreach exhibits and presentations each year (e.g., the West Virginia State Fair, hunting and fishing shows).

Geological and Economic Survey Programs

- Expand the Visiting Geologist Program (VGP)—a cooperative effort with DNR/state parks—by providing 30 informative, educational, and entertaining geology-oriented programs and hikes to visitors of West Virginia state parks in FY 2007.
- Provide talks and lectures for college classes, K-12 classes, civic clubs, etc., to share information on West Virginia geology with citizens.

Performance Measures

<u>Fiscal Year</u>	<u>Actual</u> <u>2003</u>	<u>Actual</u> <u>2004</u>	<u>Estimated</u> <u>2005</u>	<u>Actual</u> <u>2005</u>	<u>Estimated</u> <u>2006</u>	<u>Estimated</u> <u>2007</u>
VGP field trips/presentations	20	21	N/A	25	28	30
Web site education page usage	42,047	38,561	40,000	48,712	49,000	50,000